OPEN ACCESS Freely available online

Journal of Aeronautics and Aerospace Engineering

Editorial

Aero Thermodynamic : An Overview

Srikanth Nuthanapati

Department of Aeronautics, IIT Madras,Chennai,India.

EDITORIAL

Thermodynamics is a branch of physics that studies heat, function, and temperature, as well as their relationships with electricity, radiation, and matter's physical properties. The four laws of thermodynamics govern the behaviour of these quantities, which provide a quantitative definition using observable macroscopic physical quantities but can also be described in terms of microscopic constituents.

Thermodynamics is used in a broad range of science and engineering subjects, including physical chemistry, biochemistry, chemical engineering, and mechanical engineering, as well as more complex fields including meteorology. Thermodynamics arose from a desire to improve the efficiency of early steam engines, especially through the work of French physicist Nicolas Léonard Sadi Carnot (1824), who claimed that increasing engine efficiency would help France win the Napoleonic Wars. In 1854, Lord Kelvin, a Scots-Irish physicist, was the first to formulate a succinct description of thermodynamics.

The topic of thermodynamics is the relationship between heat and forces acting between contiguous parts of bodies, as well as the relationship between heat and electrical agency. The study of chemical compounds and chemical reactions was soon expanded after the initial application of thermodynamics to mechanical heat engines. Chemical thermodynamics investigates the role of entropy in chemical reactions and has contributed significantly to the field's growth and understanding.

Thermodynamics was reformulated in a variety of ways. Statistical thermodynamics, also known as statistical mechanics, is the study of statistical forecasts of particle collective motion based on microscopic conduct. Constantin Carathéodory proposed a strictly mathematical solution in an axiomatic formulation in 1909, which is known as geometrical thermodynamics.

The four laws of thermodynamics, which form an axiomatic basis, are used to describe every thermodynamic method. The first law states that energy can be transferred between physical structures in the form of heat or work.

The second law establishes the existence of a quantity known as entropy, which describes the thermodynamic direction in which a system can evolve and quantifies the state of order of a system, as well as the useful work that can be derived from it.

The interactions between large ensembles of objects are studied and classified in thermodynamics. The principles of the thermodynamic system and its surroundings are at the heart of this. A system is made up of particles whose average motions determine its properties, which are then connected to one another via state equations.

Internal energy and thermodynamic potentials, which are useful for deciding conditions for equilibrium and spontaneous processes, can be expressed using a combination of properties.

Thermodynamics can be used to explain how structures react to changes in their environment using these methods. This holds true for a broad range of science and engineering subjects, including motors, phase transitions, chemical reactions, transport phenomena, and even black holes.

***Correspondence to:** Srikanth Nutanapati, Department of Aeronautics, IIT Madras,Chennai,India, E-mail: Nutanapati8807@gmail.com

Received date: May 3, 2021; **Accepted date:** May 10, 2021; **Published date:** May 17, 2021

Citation: Nutanapati S. (2021) Aero Thermodynamics: An Overview J Aeronaut Aerospace Eng. 10:251.